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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,799	01/28/2002	Toshio Ishii	00695CD/HG	5108

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EXAMINER	
LAMB, BRENDA A	
ART UNIT	**PAPER NUMBER**
1734	5

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

MK-5

Office Action Summary

Application No.	Applicant(s)
10/058,799	Ishii et al
Examiner	**Group Art Unit**
LAMB	1734

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

P ri d for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

☑ Responsive to communication(s) filed on 1/28/02.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☑ Claim(s) 9-17, 23-26, 30-32, 35-38, 41-46 and 49-50 is/are pending in the application.

Of the above claim(s)_____ is/are withdrawn from consideration.

☑ Claim(s) 26 and 35-38 is/are allowed.

☑ Claim(s) 9-17, 23-25, 30-32, 41-46 and 49-50 is/are rejected.

☐ Claim(s)_____ is/are objected to.

☐ Claim(s)_____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The proposed drawing correction, filed on_____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on_____ is/are objected to by the Examiner.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 11 9(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number)_____.

☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

*Certified copies not received:_____.

Attachm nt(s)

☑ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☑ Notice of References Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other_____

Office Acti n Summary

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9, 10, 13, 14, 17, 23, 25, 30 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunji et al.

Gunji et al teaches the design of a hot dip galvanizing apparatus. Gunji et al apparatus is comprised of the following elements: a plating vessel with a separation wall 12 arranged therein for dividing the plating vessel into a plating zone/tank and a dross removing zone/tank which extends into the lower portion of the plating vessel; a pump for stirring the molten metal such as obviously a known pump means i.e. mechanical pump, which removes the molten metal including dross from the plating zone/tank and transfer the molten metal to the dross removing zone/tank thereby

resulting in stirring of the molten metal as a result of the circulation of molten metal between the above cited tanks/zone; a weir 15 located on or to the separation wall which provide an opening/second opening for the plating vessel to recycle the molten metal from the dross removing zone/tank; and a sink roll for immersing and conveying the strip through the molten metal. Gunji et al shows that the separation wall is arranged relative to the bottom wall of the plating vessel to provide a first opening. Thus claims 9, 10, 13, 23, 30 and 49 are obvious over Gunji et al. With respect to claim 14, Gunji et al shows in Fig. 4, a wall/separation, wall 12 of the plating vessel located at the exit side of the strip which has a height lower than surface level of the molten metal. With respect to claim 16, the recitation of the distance between strip and wall of the plating tank does not further limit the galvanizing apparatus since strip is not structurally part of the apparatus. Furthermore, the Gunji et al hot dip plating vessel is capable of being used such that a hand dipped strip is positioned a distance between side wall and bottom walls is within the scope of the claims. With respect to claim 25, Gunji et al shows in Figures 4-5 that the ratio of capacity of the above cited zones/tanks are within the scope of the claim. With respect to claim 17, the Gunji et al separation wall 12 is arranged relative to the bottom portion of the vessel or plating tank so as to form a pipe or conduit to conduct the molten metal from the plating tank to the dross removing tank.

Claims 15, 25, 32 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunji et al in view of Japan 04154948.

Gunji et al is applied for the reasons noted above. Gunji et al fails to teach the capacity of the dross removing zone/tank relative to plating zone/tank. Gunji et al also

fails to teach the distance between the strip and walls of the plating tank and distance between the sink roll and walls of the plating tank. However, it would have been obvious to optimize the distance between the Gunji et al sink roll and wall of the plating tank such that it is within the scope of the claims since Japan '948 teaches doing so to aid in the prevention of dross in the plating tank. Further, it would have been obvious given the modification of the Gunji et al apparatus as discussed above to optimize the capacity of the dross removing zone/tank such that it is greater than the plating zone/tank since Japan '948 shows doing so for the obvious reason to facilitate removal of dross in the relatively large dross settling and removal tank. Further, it would have been obvious to optimize the size of the plating tank in the Gunji et al apparatus such the plating tank has a capacity of $10m^3$ of less dependent on space requirement for the plating tank. Finally, it would have been obvious given the modifications of the Gunji et al apparatus as discussed above to optimize the pumping capacity of its pump such that it is within the scope of the claim dependent on production requirements of the hot dip galvanizing system. Thus claims 15, 25, 32 and 50 are obvious over Gunji et al.

Claims 24, 31, 41-42 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunji et al in view of Knupfer.

Gunji et al are applied for reasons noted above. It is the examiner's position that the claimed vessel and metal tank are one and the same since the sink roll is immersed and held in the vessel or tank. Gunji et al teaches at col. 6, lines 59-66, the temperature of the hot dip galvanizing both is limited to a tight temperature range. Gunji et al fails to teach the molten zinc tank includes a heating means especially a coreless induction

heating means. However, it would have been obvious given the modifications of the Gunji apparatus as discussed above to provide the zinc tank with a heating means especially a coreless induction means for the advantage of a coreless induction means for heating a molten metal both as taught by Knupfer - enable circulation of the molten metal bath yet provide for settling of dross in bottom of the molten metal tank. Thus claim 41 is obvious over the above cited references. With respect to claim 44, Gunji et al shows a snout/chute which covers or protects the entire strip including its lower strip until it reaches the molten metal in the vessel. With respect to claim 45, although Gunji et al fails to teach vessel is curved at an area joining the bottom plate and side walls, it would have been an obvious matter of design choice to shape the area joining the bottom plate and side wall such that they are curved absent persuasive evidence that the particular configuration of the claimed vessel was significant (see In re Dailey, 149 USPQ 47 (CCPA 1966)). With respect to claim 46, Gunji et al shows the vessel has a discharge opening 12' arranged at the bottom portion of the vessel. With respect to claims 24 and 31, it would have been obvious given the modification of the Gunji et al apparatus as discussed above to arrange at least one of heating devices such as taught by Knupfer in the dross removing zone for the obvious reason to facilitate in the circulation of the molten metal in the dross removing zone of the Gunji et al apparatus yet allow settling of dross and especially since coreless induction device are known as an effective means for heating molten metal bath.

Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gunji et al in view of Knupfer and Japan 041454948.

Gunji et al and Knupfer are applied for the reasons noted above. Gunji et al fails to teach the distance between the steel strip which is supported by the sink roll in the vessel and the inside wall of the vessel is 200 to 500 nm. However, it would have been obvious given the modifications of the Gunji et al to optimize the positioning of the sink roll relative to the inner walls of the tank such that they are within scope of the claims since Japan '948 teaches doing so to aid in the prevention of dross in the tank by circulation of the molten metal in the plating tank or vessel.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gunji et al in view of Knupfer and Flores.

Gunji et al and Knupfer are applied for the reasons noted. Gunji et al teaches a solid place metal or ingot 13 is arranged in the dross removing tank to re-supply the plating tank with zinc. Gunji et al fails to teach the heating manner for the dross removing tank is a dissolving means in the dross removing tank. However, it would have been obvious given the Gunji et al hot dip galvanizing system as discussed above to provide the system with a Knupfer induction heating means in the dross removing tank which would function to dissolve the solid phase zinc ingot since Flores discloses that induction heating means are capable of dissolving solid metal ingots and forming the required galvanizing liquid bath.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gunji et al in view of Japan 11-12707.

Gunji et al is applied for the reasons noted above. Gunji et al fails to teach the transfer means is a pump which has an opening to suck molten metal which is

positioned at bottom of the plating tank. However, it would have been obvious to modify the Gunji et al to provide the transfer means and a pump with a suction opening arranged in the bottom portion of the plating tank since Japan '707 shows a dross removal pump with the inlet pipe which is position at the bottom portion of the plating tank to remove dross without disturbing the dross.

Claims 26 and 36-38 are allowed.

Any inquiry concerning this communication should be directed to Brenda A. Lamb at telephone number (703) 308-2056. The examiner can normally be reached on Monday and Wednesday through Friday with alternate Tuesdays off.

B.A. Lamb/dh
May 13, 2003

BRENDA A. LAMB
PRIMARY EXAMINER